Utah Patient Safety Update

Utah Department of Health
Utah Hospitals & Health Systems Association
HealthInsight

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PATIENT SAFETY

HEALTH CARE FACILITY PATIENT SAFETY PROGRAM: Learn more about the audit that is part of the patient safety rule focusing on adverse drug events. *See page 3.*

TOOL FOR TRACKING ADVERSE DRUG EVENTS: The Adverse Drug Events Users Group sponsored by the UHA has developed an electronic tool for tracking ADEs. *See page 4* for information about this free electronic tool and a training session on May 14, 2004.

DRUG ALERT: Certain drug classes can cause specific types of cardiac arrhythmias. Special care should be taken when prescribing multiple drugs that can both cause this condition. *Learn more on page 5.*

IMPROVED REPORTING OF ADVERSE EVENTS THROUGH DISCHARGE DATA: The number of discharges reported to have a possible ADE increased 12% from the first half of 2001 to the first half of 2003. *See figure 1 on page 5.*

Crash Cart Redesign in a Community Hospital

St. Mark's Hospital, Salt Lake City, Utah

By Colleen J. O'Connor, Pharm.D.
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In the fourth quarter of 2001, several staff members at St. Mark's Hospital recognized the need to simplify and standardize the medications in the crash carts. The crash carts contained many medications that were not being utilized and only served to clutter the carts and lead to the potential for medication errors (see picture 1 on next page). The medications were also placed in foam containers right side up so that you could not see the label on the container. In addition, Cordarone® (amiodarone) was placed in a plastic bag along with a syringe, bottle of normal saline, filter needle and regular needle, which made this medication difficult to identify in a code situation.
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(Crash Cart Redesign cont. from Page 1)

A Crash Cart Team, which was an ad hoc team of the Code Blue Committee, was created to revise the Crash Cart Medication List and redesign the organization of medications in the crash carts. The team consisted of the following: Pharmacy Clinical Coordinator, Pharmacy Buyer/Automation Specialist, Director of Cardiopulmonary Services, Cardiopulmonary Educator, PCU nurse, ICU nurse, and ED nurse.

The PCU nurse performed a study using the crash cart medication drawer in use at that time to identify the most appropriate way to present medications in the crash cart. He ambushed 12 staff members from ED, ICU, PCU, cath lab and endoscopy. With the medication drawer used in 2001, the staff averaged 3 minutes, 7 seconds to retrieve 10 well-known medications (maximum: 3 minutes, 50 seconds; minimum: 2 minutes, 15 seconds). The majority of staff members had difficulty identifying amiodarone. Another common problem was quick identification of vial medications.

The PCU nurse reviewed 50 code blue sheets to determine the most commonly used medications in a code. The Crash Cart Team recommended that the brand name be placed in front of the medication on the foam tray using a label maker. Several crash cart medications were deleted and the quantity of certain medications was decreased. In addition, it was decided that the medications should be placed on their side in the foam containers so that the labels would be easily visible. These revisions created more space in the crash carts so that medications could be presented in a safe manner.

In performing a similar test using the proposed revised medication drawer, the PCU nurse purposely placed a medication vial in the wrong labeled slot to see if the nurse would administer the correct medication. One out of six nurses would have given the wrong medication. It was identified that nurses were not always checking the actual medications, but instead were relying on what they were accustomed to seeing. The majority of nurses depended on the label on the foam container rather than on the medication. Based on this, it was decided that using labels would contribute to medication errors. The following revisions were made based on study findings:

1) dark background (blue or black foam) for medications
2) elevated platform for vials (need visual access of vials without having to touch; shouldn't have to move things to locate)
3) separate amiodarone.

The Crash Cart Team then agreed on a final template for the medications in the crash carts (see picture 2). With the revised medication drawer, the staff averaged 1 minute, 8 seconds to retrieve 10 well-known medications (maximum: 1 minute, 25 seconds; minimum: 55 seconds), a dramatic improvement over the previous average of over three minutes.

The new crash carts were implemented in April 2002 after extensive education by the Cardiopulmonary educator and the PCU nurse. The PCU nurse presented the Crash Cart Redesign process at a Patient Safety Collaborative meeting in Las Vegas in April 2002.

Picture 1 (Top): Example of a cluttered crash cart.
Picture 2 (Bottom): Example of the template for the revised medication drawer for the crash cart.

Adverse Drug Event Process Improvement Audit –

Audit should be completed by 12/31/2004

The Health Care Facility Patient Safety Program Rule (R380-210) passed in October 2001 focuses on adverse drug events. The full text of this rule is available at **http://www.rules.utah.gov/publicat/code/r380/r380-210.htm**.

This rule applies to the following types of facilities:

- general acute hospitals
- critical access hospitals
- ambulatory surgical centers
- psychiatric hospitals
- rehabilitation hospitals
- orthopedic hospitals
- chemical dependency/substance abuse hospitals
- long term acute care hospitals

There are essentially two core components of the rule: a) identification/reporting of adverse drug events and b) process improvement and associated audit. Facilities that report their ICD-9-CM diagnosis data to the Department of Health already meet the reporting section of the rule. The process improvement section of the rule reads as follows:

The approved list of auditors, along with their contact information, can be found at **http://health.utah.gov/psi** under the "Auditors for ADE" tab on the left side of the screen. Auditors approved as of this date are:

- Joint Commission Resources, Inc
- Joint Commission on Accreditation of Healthcare Organizations
- Performance Improvement Company
- University of Utah Hospitals and Clinics
- *HealthInsight*
- Accreditation Association for Ambulatory Health Care for Ambulatory Surgical Centers

Hospitals receiving JCAHO audits during an 18 month window either before or after 10/15/2004 will be in compliance with the 2004 auditing requirement, if they wish to use the organization's triennial JCAHO survey to meet the requirements. A form letter must be submitted by the appropriate person at the organization to request that the JCAHO incorporate the state-mandated ADE audit into its survey. Contact Mark Crafton, Executive Director, State and External Relations at (630)792-5260.

If you have questions or comments, please contact Deb Wynkoop, Director, Bureau of Licensing, at (801) 538-6152.

R380-210-4. Patient Injury Reduction

1. Each facility shall implement processes that are effective in reducing the incidence of:

(a) adverse drug events.

2. Each facility shall have the implementation and effectivemenss of the internal patient injury reduction processes required in R380-210-4(1) audited every three years by an independent auditor approved by the Department's Facility Licensing Commitee.

THANKS!

The Utah Patient Safety Consortium would like to thank hospitals for their cooperation in the post-intervention chart review that began in January 2004. The review will continue through this summer. We greatly appreciate support from the participating hospitals.

ADE REPORTER: FREE TOOL AND UPCOMING TRAINING SESSION

The Adverse Drug Event Users Group sponsored by the Utah Hospitals and Health Systems Association (UHA) recognized a need for a simple yet powerful tool that clinical personnel could use to track adverse drug events.

This tool was developed by pharmacists and clinicians and was originally beta tested in paper form. Once improvements were made based on feedback from these tests, the electronic tool was developed and again beta tested in pilot hospitals. Version 1.0 of this tool is now complete! The tool runs in Microsoft Access. It is designed to allow users to either record a minimal set of information on adverse drug events or enter more detailed characteristics if they wish.

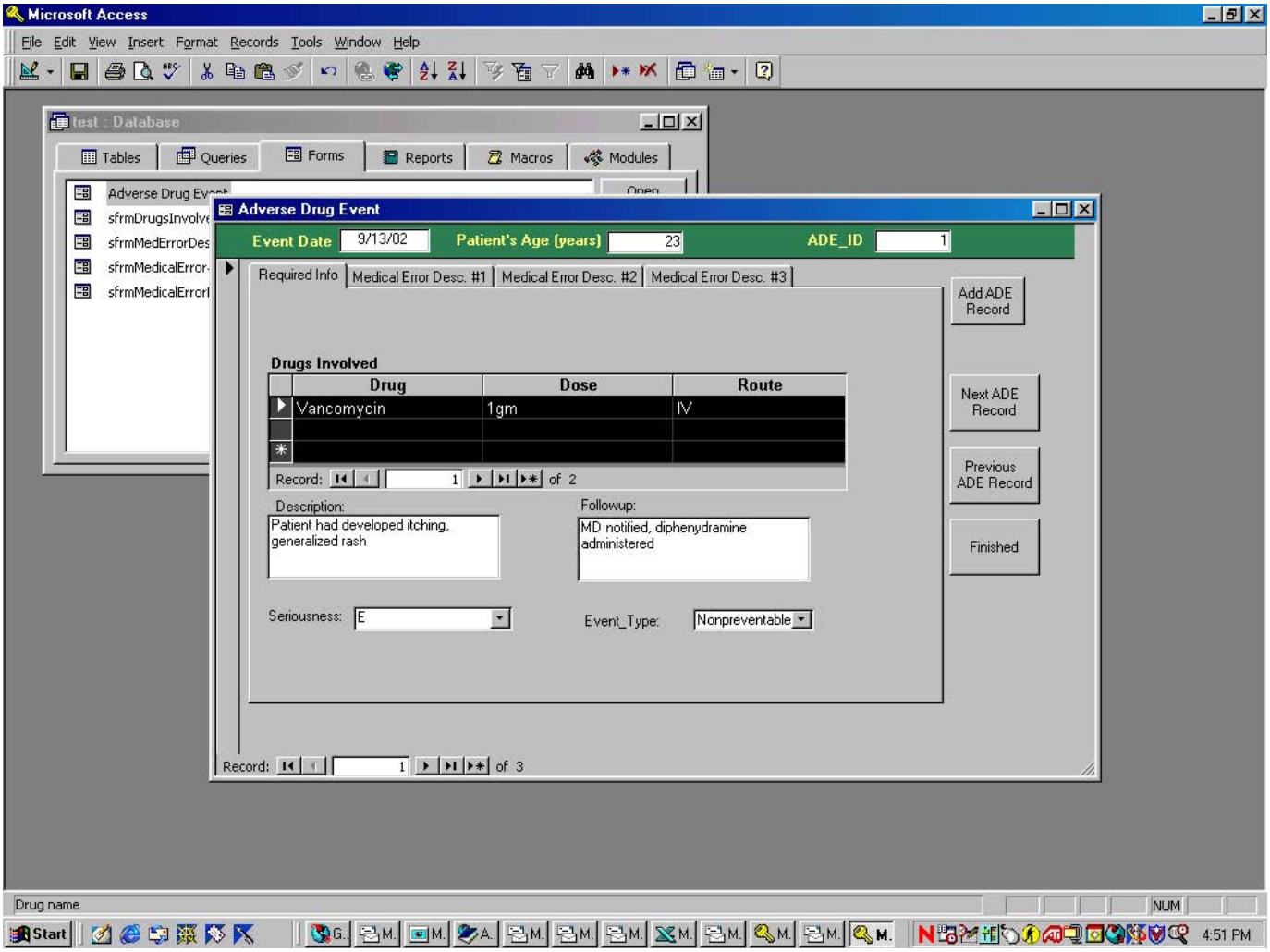
This tool is free of charge and is available in both electronic and paper versions.

If you are interested in obtaining a free copy of

Workshop On Use of Adverse Drug Event Electronic Reporting Form

Co-sponsored by UHA, Utah Hospitals & Health Systems Association, Utah Department of Health, Utah Medical Association and *HealthInsight* Under the Auspices of the Utah Patient Safety Steering Committee

A Training session for this will be held May 14th at 9 AM in the second floor auditorium in the Women's Pavilion at St. Marks Hospital in Salt Lake City.



Drug Alert:

Watch out for cardiac arrhythmias when combining atypical antipsychotics and fluoroquinolones

By Erin R. Fox Pharm.D.
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Patients who take combinations of drugs known to prolong the QT interval are at risk for developing torsades de pointes, a potentially fatal arrhythmia.[1] All atypical antipsychotics and fluoroquinolones block potassium channels, potentially causing QT prolongation.[2-6] **In particular, avoid the combination of ziprasidone (Geodon) and fluoroquinolones.** The package insert for ziprasidone specifically indicates that concurrent therapy with any agent known to prolong the QT interval, including gatifloxacin (Tequin) or moxifloxacin (Avelox) is contraindicated. Additionally, the package insert for gatifloxacin also recommends avoiding concomitant use of any agent that can cause QT prolongation.[8] While these agents carry specific warnings, this interaction is a possibility for the combination of any atypical antipsychotic or fluoroquinolone. Clinicians may find a list of drugs known to cause QT prolongation at **www.qtdrugs.org**.

1. Al-Khatib SM, LaPointe NM, Kramer JM, Califf RM. What clinicians should know about the QT interval. Jama 2003; 289:2120-7.
2. Owens RC, Jr. Risk assessment for antimicrobial agent-induced QTc interval prolongation and torsades de pointes. Pharmacotherapy 2001; 21:301-19.
3. Owens RC, Jr., Ambrose PG. Torsades de pointes associated with fluoroquinolones. Pharmacotherapy 2002; 22:663-8; discussion 668-72.
4. Witchel HJ, Hancox JC, Nutt DJ. Psychotropic drugs, cardiac arrhythmia, and sudden death. J Clin Psychopharmacol 2003; 23:58-77.
5. Meltzer HY, Davidson M, Glassman AH, Vieweg WV. Assessing cardiovascular risks versus clinical benefits of atypical antipsychotic drug treatment. J Clin Psychiatry 2002; 63 Suppl 9:25-9.
6. De Ponti F, Poluzzi E, Cavalli A, Recanatini M, Montanaro N. Safety of non-antiarrhythmic drugs that prolong the QT interval or induce torsade de pointes: an overview. Drug Saf 2002; 25:263-86.
7. FDA. 2002 Safety Alert - Geodon (ziprasidone HCl). Available at **www.fda.gov/medwatch/SAFETY/2002/geodon.htm**. Accessed 3/24/04.: Department of Health and Human Services.
8. Tequin (gatifloxacin) product information. Princeton, NJ: Bristol-Meyers Squibb, 2003.

Would you like to see information on a particular medication or drug-drug interaction in our next quarterly update? Let us know at healthcarestat@utah.gov

Figure 1. Percentage of Inpatient Discharges With At Least One Adverse Drug Event (ADE) by Six-Month Period, 41 Utah Acute Care Hospitals, Jan 2001 through Jun 2003

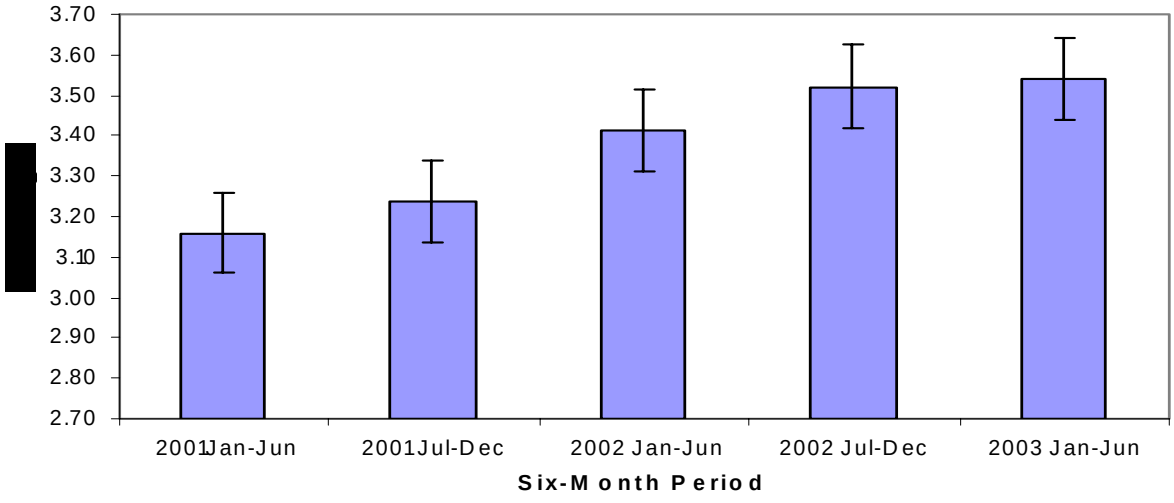

Figure 1. As was hoped with better detection and reporting the percentage of inpatient discharges with at least on ADE has increased significantly from 2001 to 2003.

Figure 2. Percentage of Inpatient Discharges With At Least One Adverse Drug Event (ADE) by ADE Group and Six-Month Period, 41 Utah Acute Care Hospitals, Jan 2001 through Jun 2003

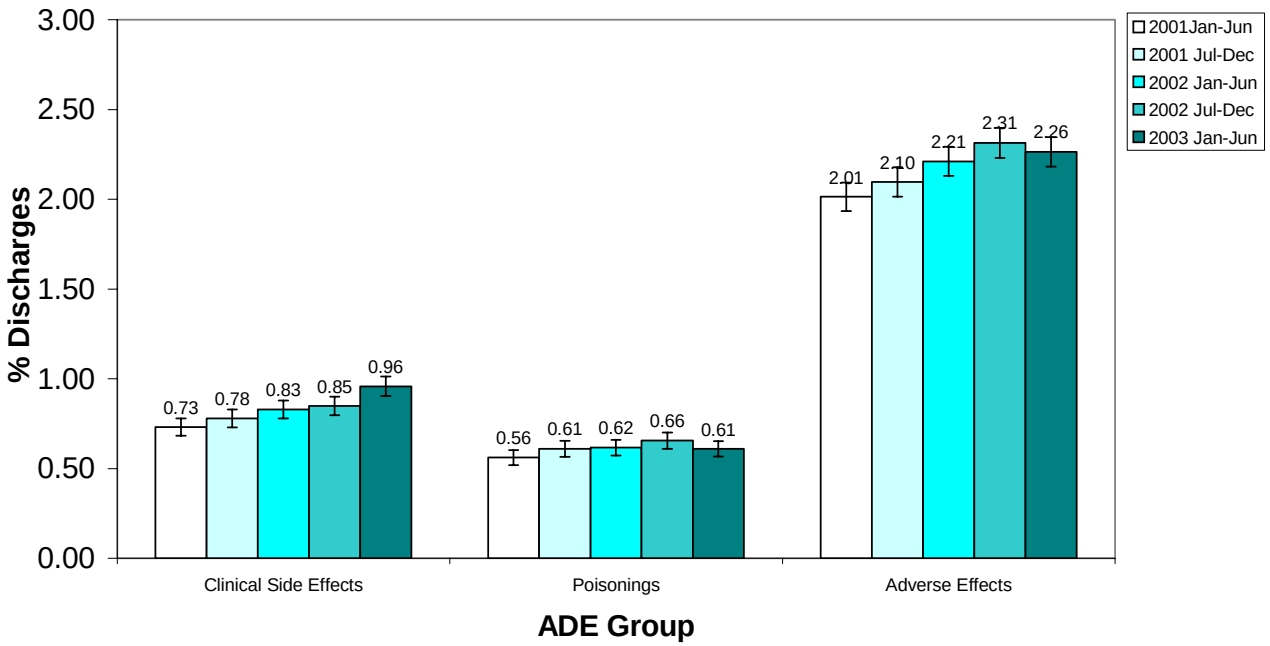

Figure 2 breaks down the ADE trends in Figure 1 into three groups: clinical side effects, poisonings, and adverse effects.

TABLE 1. NUMBER OF INPATIENT DISCHARGES WITH ADVERSE DRUG EVENT (ADE) BY ICD-9-CM CODE ADE GROUP AND ADE CLASS AND 6-MONTH PERIOD, 41 UTAH ACUTE CARE HOSPITALS, JAN-JUN 2001, JUL-DEC 2001, JAN-JUN 2002, JUL-DEC 2002, JAN-JUN 2003

ICD-9-CM ADVERSE DRUG EVENT GROUP AND CLASS	JAN-JUN 2001	JUL-DEC 2001	JAN-JUN 2002	JUL-DEC 2002	JAN-JUN 2003
Total Discharges With At Least One Adverse Drug Event	3,834	3,836	4,237	4,320	4,507
Clinical Manifestations of Adverse Drug Events	888	923	1,029	1,041	1,218
Drug psychoses	366	441	443	561	575
Dermatitis	238	224	261	235	324
Maternal causes of perinatal morb., mort. & drug rxns	21	15	18	12	15
Rash, spontaneous ecchymoses	265	252	310	237	307
Poisoning by:	681	722	765	805	776
Antibiotics and other antiinfectives	5	7	8	8	9
Hormones and synthetic substitutes	16	26	33	20	32
Primarily systemic agents	34	50	33	35	38
Agents affecting blood constituents	18	14	20	18	15
Analgesics, antipyretics, antirheumatics	215	214	248	237	252
Anticonvulsant and anti-Parkinsonian drugs	43	37	41	45	40
Sedatives and hypnotics	46	64	68	66	72
Other CNS depressants, stimulants, anesthetics	40	51	54	48	40
Psychotropic agents	256	287	306	316	325
Other agents	117	116	123	134	138
Undetermined whether accidentally or purposely inflicted	77	85	79	114	92
Adverse Effects of:	2,542	2,483	2,745	2,839	2,881
Antibiotics and other antiinfectives	220	228	279	260	289
Hormones and synthetic substitutes	349	296	322	382	367
Primarily systemic agents	285	273	295	311	290
Agents primarily affecting blood constituents	211	208	230	246	210
Analgesics, antipyretics, antirheumatics	493	520	553	651	589
Anticonvulsant and anti-Parkinsonian drugs	72	64	81	74	81
Sedatives and hypnotics	97	102	137	104	131
Other CNS depressants, stimulants, anesthetics	112	95	135	94	110
Psychotropic agents	124	150	153	166	186
Agents affecting cardiovascular system	288	258	269	294	290
Other drugs, biological, medicinal substances	378	370	380	386	458
Total Inpatient Discharges For 6-Month Period	121,403	118,415	124,131	122,676	127,268

SOURCE: Utah Hospital Discharge Database, 2001-2003, Utah Department of Health.

Table 1 shows the number of inpatient discharges with one or more potential ADEs through June 2003.

TABLE 2. PERCENTAGE OF INPATIENT DISCHARGES WITH ADVERSE DRUG EVENT (ADE) BY ICD-9-CM CODE ADE GROUP AND ADE CLASS AND 6-MONTH PERIOD, 41 UTAH ACUTE CARE HOSPITALS, JAN-JUN 2001, JUL-DEC 2001, JAN-JUN 2002, JUL-DEC 2002, JAN-JUN 2003

ICD-9-CM ADVERSE DRUG EVENT GROUP AND CLASS	JAN-JUN 2001	JUL-DEC 2001	JAN-JUN 2002	JUL-DEC 2002	JAN-JUN 2003
Total Discharges With At Least One Adverse Drug Event	3.16	3.25	3.42	3.53	3.54
Clinical Manifestations of Adverse Drug Events	0.73	0.78	0.83	0.85	0.96
Drug psychoses	0.30	0.37	0.36	0.46	0.45
Dermatitis	0.20	0.19	0.21	0.19	0.25
Maternal causes of perinatal morb., mort. & drug rxns	0.02	0.01	0.01	0.01	0.01
Rash, spontaneous ecchymoses	0.22	0.21	0.25	0.19	0.24
Poisoning by:	0.56	0.61	0.62	0.66	0.61
Antibiotics and other antiinfectives	0.00	0.01	0.01	0.01	0.01
Hormones and synthetic substitutes	0.01	0.02	0.03	0.02	0.03
Primarily systemic agents	0.03	0.04	0.03	0.03	0.03
Agents affecting blood constituents	0.01	0.01	0.02	0.01	0.01
Analgesics, antipyretics, antirheumatics	0.18	0.18	0.20	0.19	0.20
Anticonvulsant and anti-Parkinsonian drugs	0.04	0.03	0.03	0.04	0.03
Sedatives and hypnotics	0.04	0.05	0.05	0.05	0.06
Other CNS depressants, stimulants, anesthetics	0.03	0.04	0.04	0.04	0.03
Psychotropic agents	0.21	0.24	0.25	0.26	0.26
Other agents	0.10	0.10	0.10	0.11	0.11
Undetermined whether accidentally or purposely inflicted	0.06	0.07	0.06	0.09	0.07
Adverse Effects of:	2.10	2.10	2.22	2.32	2.26
Antibiotics and other antiinfectives	0.18	0.19	0.23	0.21	0.23
Hormones and synthetic substitutes	0.29	0.25	0.26	0.31	0.29
Primarily systemic agents	0.24	0.23	0.24	0.25	0.23
Agents primarily affecting blood constituents	0.17	0.18	0.19	0.20	0.17
Analgesics, antipyretics, antirheumatics	0.41	0.44	0.45	0.53	0.46
Anticonvulsant and anti-Parkinsonian drugs	0.06	0.05	0.07	0.06	0.06
Sedatives and hypnotics	0.08	0.09	0.11	0.08	0.10
Other CNS depressants, stimulants, anesthetics	0.09	0.08	0.11	0.08	0.09
Psychotropic agents	0.10	0.13	0.12	0.14	0.15
Agents affecting cardiovascular system	0.24	0.22	0.22	0.24	0.23
Other drugs, biological, medicinal substances	0.31	0.31	0.31	0.32	0.36
Total Inpatient Discharges For 6-Month Period	121,176	118,201	123,867	122,416	127,268

SOURCE: Utah Hospital Discharge Database, 2001-2003, Utah Department of Health.

Table 2 shows the percentage of inpatient discharges detailed breakdown with at least one ADE.

Table 3. The ICD-9-CM Codes of Adverse Drug Events (ADE) by ADE Class, Utah, 41 Acute Care Hospitals, 2002 Version

Class No.	Adverse Event Class	ICD-9-CM Codes Included
1	Drug psychoses	292
2	Dermatitis	692.3,692.9,693.0,693.8,693.9
3	Maternal causes of perinatal morbidity and mortality, Drug reactions and intoxications specific to newborn	760.72,760.74,763.5,779.4
4	Rash, spontaneous ecchymoses	782.1,782.7
5	Poisoning by antibiotics and other antiinfectives	960-961, E856-857
6	Poisoning by hormones and synthetic substitutes	962, E858.0
7	Poisoning by primarily systemic agents	963, E858.1
8	Poisoning by agents primarily affecting blood constituents	964, E858.2
9	Poisoning by analgesics, antipyretics, antirheumatics	965, E850
10	Poisoning by anticonvulsant and anti-Parkinsonian drugs	966, E855.0
11	Poisoning by sedatives and hypnotics	967, E851-852
12	Poisoning by other CNS depressants, stimulants, anesthetics, nervous system agents	968, E855.1-855.9
13	Poisoning by psychotropic agents	969, E853, E854
14	Poisoning by other agents	909.0, 970-979, E858.3-858.9, E929.2
15	Adverse effects of antibiotics and other antiinfectives	E930-E931
16	Adverse effects of hormones and synthetic substitutes	E932
17	Adverse effects of primarily systemic agents	E933
18	Adverse effects of agents primarily affecting blood constituents	E934
19	Adverse effects of analgesics, antipyretics, antirheumatics	E935
20	Adverse effects of anticonvulsant and anti-Parkinsonian drugs	E936
21	Adverse effects of sedatives and hypnotics	E937
22	Adverse effects of other CNS depressants, stimulants, anesthetics, nervous system agents	E938, E940-941
23	Adverse effects of psychotropic agents	E939
24	Adverse effects of agents primarily affecting the cardiovascular system	E942
25	Adverse effects of other drugs, biological, medicinal substances in therapeutic use	E943-E949.909.5
26	Poisoning (undetermined whether accidentally or purposely inflicted)	E980.0-E980.5,E980.9

Source: The Utah/Missouri Patient Safety Project, National Expert Panel for ICD-9-CM Classification of Adverse Events, 2002

Table 3 shows the classification of 420 ICD-9-CM DX codes and E-codes in 26 classes of ADEs as described in this report's section, "About Adverse Events." A detailed list of the codes for these 26 ADE classes, as well as the other 40 classes of adverse events, is available on the website health.utah.gov/psi.

Acknowledgements

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Utah Department of Health
HealthInsight
UHA, Utah Hospitals and Health Systems Association
University of Utah, Department of Medical Informatics
LDS Hospital, Intermountain Health Care
Missouri Department of Health and Senior Services
Missouri Patient Care Review Foundation
University of Missouri-Columbia, School of Medicine

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For more information about this project, contact Paul Hougland at (801) 538-6353 or HealthCareStat@utah.gov.

To receive additional copies of this update, or back issues of the Utah Patient Safety Update, contact the Office of Health Care Statistics at:

Phone: 801-538-7048
Fax: 801-538-9916
Email: healthcarestat@utah.gov
Internet: health.utah.gov/psi

About the Data and ICD-9-CM Codes

The Utah Hospital Discharge Database has nine fields for reporting ICD-9-CM diagnosis codes and one field for reporting the principal E-code. The database contains patient-level information about all hospitalizations that occur in all of Utah's licensed hospitals. The Utah Health Data Committee, through its staff in the Utah Department of Health, collects the data under the authority of the Utah Health Data Authority Act.

Limitations of Using the Administrative Data and the ICD-9-CM Classification for Detecting Adverse Drug Events

- Unable to separate the events that occurred prior to current hospitalization from those that occurred during hospitalization
- Unable to categorize degree of harm
- Unable to capture near misses
- Unable to perform reliable inter-institutional comparisons due to coding variation among facilities

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